

Study Plan to Inventory Breeding Birds at:
Marsh-Billings-Rockefeller National Historical Park, Woodstock, VT
and
Saint-Gaudens National Historic Site, Cornish, NH

Start Date: February 1, 2001
End Date: June 1, 2003

Total Project Cost: \$30,087

Funds Requested: \$28,000

Principal Investigator:

Steven D. Faccio
Conservation Biology Department
Vermont Institute of Natural Science
Woodstock, Vermont

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Introduction

Marsh-Billings-Rockefeller National Historical Park

The Marsh-Billings-Rockefeller National Historical Park (MABI) is the only national park to focus on conservation history and the evolving nature of land stewardship in America. Opened in June of 1996, Vermont's first national park preserves and interprets the historic 555-acre Marsh-Billings-Rockefeller property in Woodstock. The National Park Service (NPS) plans to operate the forest as a working landscape with educational forestry demonstrations, exhibits, and sustainable forestry practices. To attain these goals, a forest management plan is being developed for the park. In order to help guide the development of this plan, park managers need comprehensive information about the biological resources that occur within the park and how management practices might affect the status and distribution of these resources.

Currently, the final year of fieldwork on a two-year inventory of amphibian and reptile populations within the park is being concluded. Draft results from this project will be available by March 2001, and will include a detailed inventory of the composition, distribution, and status of amphibians and reptiles within the park, an evaluation of species richness and relative abundance within the 3 primary forested habitats (hardwoods, mixed stands, and conifer plantations), and information about ecologically sensitive and/or critical areas (e.g., vernal pools or other breeding sites, hibernaculums, migration corridors etc.) where forest management may be restricted. These results will provide important data that will aid in developing ecologically sound management and future monitoring strategies for the park.

To complement the amphibian and reptile inventory, detailed information about the breeding bird population within the MABI is needed. Breeding bird populations have not been systematically surveyed by the NPS or previous landowners, and very little anecdotal information exists on the status and distribution of bird species within the park. The largely forested 555-acre park ranges from approximately 700 to 1450 feet in elevation, and supports mature northern hardwood and mixed forests, conifer plantations, cliff/rocky outcrop communities, and open fields maintained by both mowing and light grazing. In addition, there is a 15-acre pond, a stream, and several small forested wetlands and seeps. To help lay the groundwork necessary for park managers to make informed decisions about forest management within the park, and to formulate effective monitoring strategies for the future, a quantitative assessment of breeding bird populations on the Marsh-Billings-Rockefeller NHP is needed.

Saint-Gaudens National Historic Site

Saint-Gaudens National Historic Site (SAGA) was formally established in 1964 by the National Park Service in order to preserve the properties associated with the life and cultural achievements of Augustus Saint-Gaudens, a famed American sculptor. Saint-Gaudens lived and worked as an artist in the Cornish Colony from 1885 to 1907. At present, the Historic Site and adjacent natural areas include approximately 148 acres of open and forested land.

The landscape at SAGA exhibits a mixture of vegetation contrasts and diverse topographic features. While the core of the Historic site contains a variety of managed and planted lawns and gardens, the natural area is characterized by a diverse pattern of forest and wetland vegetation that is distributed like a mosaic over the terraces, ravines, floodplains, and hillslopes of the site. Like much of the rest of New Hampshire, the natural vegetation is in dynamic state of gradual successional change. Areas that were mown lawn or pastures during the period of Saint-Gaudens life are now young successional forests. In other sections, vigorous wetland communities have encroached upon former areas of open water in Blow-Me-Down Pond. Elsewhere, former pine and hemlock mature forests have been transformed by logging activities to uneven-aged mixed successional forests.

Natural resource inventories in 1980, 1986 and 1994 documented many vascular plant and vertebrate species except birds. Additional inventories are underway for fish, and reptiles and amphibians (1998 and 2000). Management of the cultural landscape at Saint-Gaudens is an ongoing task and some natural resources may be influenced by such action. The park supports a diverse herp community and is developing long-term monitoring protocols and vernal pool protection strategies. There is a need to update the park's bird inventory and conduct more in-depth breeding bird studies.

Project Goals and Objectives

The broad goal of this inventory is to provide park managers with comprehensive, science-based information about breeding bird populations that occur within the park boundaries. This will help park staff formulate effective stand-specific management strategies that will reflect MABI's theme of conservation stewardship, and help develop future monitoring goals for both parks. The specific goals of the inventory are to:

- 1) Develop baseline data on the composition, distribution, and status of breeding birds within the Marsh-Billings-Rockefeller NHP and adjacent lands, and Saint-Gaudens National Historic Site.
- 2) Evaluate species richness and relative abundance across basic habitat types (conifer plantations, mixed forest stands, hardwood stands, wetlands, and open fields).
- 3) Identify ecologically sensitive and/or critical areas (e.g., nest sites of raptors and/or grassland species, etc.) where forest management and/or mowing regimes may be restricted.

To achieve these goals, the inventory will be designed to meet the following basic objectives:

- 1) To document through field investigations the occurrence of at least 90% of the breeding bird species estimated to exist within both parks.
- 2) To describe the distribution and relative abundance of any state and/or federally-listed Endangered and Threatened species, species of Special Concern, and/or exotics occurring within the parks.
- 3) To provide information necessary to develop a general monitoring strategy and design tailored to specific threats and resource issues of the parks, which can be implemented following the inventory.

Methods

Several different methods will be used to inventory birds at MABI and SAGA, including unlimited distance point counts, audio-playback surveys for diurnal and nocturnal raptors, area searches, and limited nest searching and monitoring. In addition, the *Records of Vermont Birds*, a database of Vermont bird sightings compiled seasonally since 1973 by the Vermont Institute of Natural Science, will be searched for existing relevant records from MABI. Volunteers will be recruited to assist with area searches and other aspects of the inventories.

Point Counts

The main goals of the inventories are to document 90% of the bird species on a presence absence basis by habitat, and collect distribution and abundance data for species of management concern. Therefore, unlimited distance point counts will be used to document most avian species and to establish a baseline from which to detect trends over time. At both MABI and SAGA, the sampling frame for point count locations will be established in ArcView by overlaying a 250 m grid on top of park boundaries, cover types, and other GIS layers. During winter 2001, these points will then be located in the field using a Trimble GPS unit and marked with flagging and aluminum tree tags or hardwood stakes. Approximately 60 point counts will be established at MABI and adjacent lands (including the Woodstock Town Park and King Farm properties), and 10 point counts at SAGA. Each point count will be visited 3 times during the

breeding season (mid-May through June) on mornings with favorable weather conditions, and surveyed for 10 minutes, with each count divided into 3, 2, and 5 minute intervals. Surveys will begin within 15 minutes of sunrise and will be completed in less than four hours. Species not detected during point counts, but observed between stations will be recorded for a species list.

Audio-Playback Surveys

Although occasional sightings of owls may occur during point counts, more reliable results are obtained using tape playback surveys to elicit vocal responses from these nocturnal species. Owls will be surveyed at playback stations spaced at approximately 1 km intervals and located along existing roads or trails. Each point will be visited twice at least 30 minutes after sunset; once between March 5 and 15 and once between April 5 and 15. At each point, observers will listen for 3 minutes and then broadcast an audio playback alternating between owl vocalizations and silent listening periods. The taped sequence will be as follows: 20 seconds of Northern Saw-whet Owl calls, a minute of listening, 20 seconds of Eastern Screech Owl calls, a minute of listening, 20 seconds of Barred Owl calls, a minute of listening, 20 seconds of Great Horned Owl calls, a minute of listening. The total observation time at each station will be 8:20 minutes.

Hawks in the genus *Accipiter* will be surveyed with audio-playback at a subset of the point count stations (approximately 10% of the point counts at MABI, and 2 or 3 points at SAGA). Each point, located in appropriate forested habitat and spaced at approximately 1 km intervals, will be visited twice during April. At each point the observer will broadcast 10 seconds of Sharp-shinned Hawk calls, followed by a minute of listening, then 10 seconds of Northern Goshawk calls, followed by another minute of listening.

Area Searches

Area searches for species not well surveyed by other methods, particularly hawks and waterfowl, will be conducted in appropriate habitats between April 15 and July 30. Special attention will be paid to locating nests of *Accipiter* species and woodland *Buteos*, as well as documenting waterfowl species breeding in park wetlands. In addition, grassland habitat at MABI will be surveyed to determine the number of breeding Bobolink pairs, and cliff areas on lands adjacent to MABI will be searched for nesting Common Ravens and Turkey Vultures. During area searches, efforts will be made to locate and monitor nests of other species as well.

Data Analysis

A variety of techniques will be used to analyze and summarize inventory data. Graphs, tables, histograms, and GIS maps will be used to present data in final reports. The historical and predicted species list compiled in accordance with the criteria set forth in Fancy (2000) and Fancy and Sauer (2000) will be used to determine if the goal of 90% of the predicted species for each park has been reached. Indices of species richness and relative abundance will be determined park-wide and by habitat where appropriate.

Project Personnel

The personnel for this project will include the following:

<u>Principal Investigator:</u>	Steve Faccio, Staff Biologist, Vermont Institute of Natural Science
<u>Project Coordinators:</u>	Kyle Jones, Park Resources Manager, Marsh-Billings-Rockefeller NHP Steve Walasewicz, Park Resources Manager, Saint-Gaudens National Historic Site
<u>Field Biologist:</u>	To be determined

Project Budget

- ◆ One field biologist will be hired at \$15/hour to conduct point count surveys and area searches between mid-May and July each year.
- ◆ The Principal Investigator will conduct the GPS work, audio playback surveys, and assist with area searches at a rate of \$20/hour.

MABI NHP (2001 and 2002)

Category	Item	Number	Person Days	Cost
Point Counts	GIS analysis to establish sampling frame grid		2	\$ 320
	GPS work to locate and mark points	Approx. 60	4	\$ 640
	Days to complete study	20 annually	40	\$ 4,800
Audio-playbacks	Owl Survey	2 annually	2	\$ 320
	Hawk Survey	2 annually	2	\$ 320
Area Searches	Focal species, opportunistic nest searching	20 annually	40	\$ 5,200
Other	Travel, Vehicle miles @ \$0.325/mile	250 miles annually		\$ 160
	Misc. office supplies and equipment (fieldbooks, flagging, recordings, etc)			\$ 500
	TOTAL for MABI			\$12,260

SAGA NHS (2001 and 2002)

Category	Item	Number	Person Days	Cost
Point Counts	GIS analysis to establish sampling frame grid and base maps		2	\$ 320
	GPS work to locate and mark points	Approx. 10	2	\$ 320
	Days to complete study	6 annually	12	\$1,440
Audio-playbacks	Owl Survey	2 annually	2	\$ 320
	Hawk Survey	2 annually	2	\$ 320
Area Searches	Focal species, opportunistic nest searching	10 annually	20	\$2,600
Other	Travel, Vehicle miles @ \$0.325/mile	1,000 miles annually		\$ 650
	Misc. office supplies and equipment (fieldbooks, flagging, recordings, etc)			\$ 500
	TOTAL for SAGA			\$6,470

Summary Budget

Item	Cost
Inventory for MABI for 2-years	\$12,260
Inventory for SAGA for 2-years	\$ 6,470
Database development, data entry/error checking for both parks for both years	\$ 1,500
Data analysis	\$ 3,500
Report preparation (annual progress reports and final reports for both parks)	\$ 4,000
SUBTOTAL	\$27,730
Institutional overhead costs (8.5%)	\$ 2,357
TOTAL	\$30,087
VINS seeks \$18,000 from the NPS to cover inventory costs at MABI and \$10,000 for costs at SAGA. Additional costs will be contributed from VINS' operating budget.	

Deliverables

Following the completion of this survey, the principle investigator will provide the following:

1. Copies of all data recording sheets.
2. Copies of printed and digital raw survey data.
3. Analyses of species richness and relative abundance at both the park-wide and habitat levels.
4. Final report detailing the methodology, implementation, analyses, and results.
5. ArcView GIS themes and digital databases including:
 - the distribution of all breeding bird species detected during the project
 - the locations of ecologically sensitive and/or critical areas within the park
 - the locations of all sample points, transects, and survey routes.
 - data documentation with metadata conforming to Federal Geographic Data Committee Standards under Executive Order 12906, April 11, 1994.
6. Recommendations for a long-term monitoring strategy with adequate statistical power, that will detect changes in species richness and relative abundance over time, and will allow for an assessment of the impacts of forest management on bird populations within the Marsh-Billings-Rockefeller NHP.

Project Schedule

2001

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|----------------------------|---|
| 1. February 2001 | Determine sampling sites and transect locations, hire field biologist |
| 2. March – October 2001 | Conduct Year 1 surveys and begin database assembly |
| 3. October – December 2001 | Complete data entry and summarize Year 1 results |

2002

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|----------------------------|---|
| 4. March – October 2002 | Conduct Year 2 surveys and database management |
| 5. October – December 2002 | Complete data entry and begin analyses of survey data |

2003

- | | |
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| 6. March 2003 | Draft Final Report |
| 7. June 2003 | Final report |

Literature Cited

- Fancy, Steven G. 2000. Guidance for the design of sampling schemes for inventory and monitoring of biological resources in National Parks. The National Park Service Inventory and Monitoring Homepage, www.nature.nps.gov/sfancy.
- Fancy, S.G. and Sauer, J.R. 2000. Recommended methods for inventorying and monitoring landbirds in National Parks. The National Park Service Inventory and Monitoring Homepage, www.nature.nps.gov/sfancy.

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EDUCATION

B.A. Biology, Western Connecticut State University, 1983.
M.S. Biology, Southern Connecticut State University, 1992.
M.S. Thesis: "Activity patterns and habitat selection of reintroduced fishers (*Martes pennanti*) in northwest Connecticut".

EXPERIENCE

9/92-Present Conservation Biologist, Vermont Institute of Natural Science, 27023 Church Hill Rd., Woodstock, VT 05091.

- **Project Director of:**

Forest Bird Monitoring Project — Coordinate state-wide surveys of forest interior breeding bird species utilizing point count methodology. Involves grant writing, coordination of volunteer network, data management and analyses, and report writing.

Peregrine Falcon Survey and Restoration Project — Coordinate state-wide monitoring of breeding population of Peregrine Falcons. Responsibilities include supervision of seasonal biologist, banding chicks at cliff nesting sites, co-authoring annual report, budget management.

VINS Bird Banding Station — Coordinate bird banding station during May - November. Operate constant-effort mist-netting station, train and supervise volunteer and paid seasonal banders, manage and analyze banding data, produce annual summaries, reports, and submission of banding records to Bird Banding Lab.

Herp Inventory Project — Principal investigator of 2-year inventory of reptile and amphibians at the Marsh-Billings-Rockefeller National Historical Park. Responsibilities include all aspects of project development and implementation, training and supervision of seasonal biologist, interns, and volunteers, data management and analyses, and budget management. Methods include drift fence/pit-falls, cover board arrays, and calling and visual encounter surveys.

Salamander Emigration Study — Principal investigator of a 1-year study using radio telemetry implants to evaluate the post-breeding movement patterns, emigration distances, and terrestrial habitat use of Jefferson and spotted salamanders.

Ice Storm Effects Study -- Principal investigator of a 3-year study assessing the changes in breeding bird populations following the 1998 ice storm. Point count data collected between 1999 and 2001 will be compared to pre-storm data from six study sites in Green Mt. National Forest.

- **Coordinates state-wide surveys of:**

North American Breeding Bird Survey routes
Calling Frog Survey routes

- **Other Duties include:**

- Managing Editor of quarterly publications, *Vermont Birds* and *Records of Vermont Birds*.
- Writes research reports, papers, and articles for publication.
- Leads natural history field trips.
- Serve on the Bragdon Nature Preserve Management Committee
- Serve on the VT Endangered Species Committee's Scientific Advisory Group on reptiles and amphibians.

EXPERIENCE (CONT.)

5/90 - 8/92 **Research Assistant**, State of Connecticut, Wildlife Division, Burlington, CT.

- Used radio telemetry to monitor dispersal, distribution, activity patterns, and habitat selection of reintroduced population of fishers.
- Conducted snowtracking surveys of protected furbearers (bobcat, fisher, black bear).
- Performed necropsies on mink, river otter, fisher, bobcat, and coyote to determine age structure and productivity of populations.
- Monitored populations of Piping Plovers and Least Terns along Connecticut coast. Implemented conservation measures to protect nesting colonies.
- Interpreted behavior and ecology of wintering Bald Eagles at observation area located at Hydroelectric Dam.

3/84 - 5/90 **Naturalist/Educator**, Stamford Museum and Nature Center, 39 Scofieldtown Rd., Stamford, CT 06903.

- Designed, coordinated and implemented a variety of educational materials and programs on conservation and natural history to a variety of audiences.
- Developed, designed and produced natural history exhibits for display.
- Curator of Ornithology Collection.

PUBLICATIONS

Faccio, S.D. and H.J. Russock. 1984. Status of a population of bald eagles wintering in western Connecticut. *Raptor Research*, 18(2): 77-78.

Faccio, S.D. 1990. Nature's Drummer. *Country Journal*, vol.XVII, No.2, pp58-61.

Faccio, S.D. 1991. The Killdeer. *Country Journal*, vol.XVIII, No.3, pp43-47.

Faccio, S.D. 1995. Cutting Through the Fog. *Living Bird*, vol.14, No.1, pp20-24.

Faccio, S.D. and J. Corser. 1995. The reoccupancy of historic Peregrine Falcon nest sites in Vermont, their current status and future prospects. Vermont Botanical and Bird Club, Joint Bulletin No. 21, Dec. 1995, pp19-24.

Faccio, S.D. 1996. Predation of an eastern chipmunk (*Tamias striatus*) by a gray squirrel (*Sciurus carolinensis*). *The Canadian Field Naturalist*, 110(3): 538.

Faccio, S.D., C. C. Rimmer, and K.P. McFarland. 1998. Results of the Vermont Forest Bird Monitoring Program, 1989-96. *Northeastern Naturalist*, 5(4): 293-312.

Faccio, S.D., and C.C. Rimmer. 1999. High rates of Brown-headed Cowbird occurrence in Champlain Valley forests: Conservation implications for migratory songbirds. In: Manley, T.O. and P.L. Manley, editors. *Lake Champlain in Transition: From Research Toward Restoration*. American Geophysical Union, Washington D.C., pp 361-370.

Faccio, S.D. 1999. Loons: Sound and Spirit of the Northern Woods. *Vermont Woodlands*, vol. 6, No.1, pp24-27.